Visits with Nontyphoidal Salmonella Infections Reported to the BioSense System, 2006-2007

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OBJECTIVE

To describe visits reported from BioSense hospitals with non-typhoidal Salmonella infections.

BACKGROUND

Biosurveillance systems typically receive free-text chief complaint and coded diagnosis data, however this data has limited specificity for notifiable disease surveillance. The Biosense System receives chief complaint and/or diagnosis data from over 360 hospitals and laboratory results from 24 hospitals in 7 states using the Public Health Information Network Messaging System (PHINMS) and HL7 standards. BioSense also receives final diagnosis from Veterans' Affairs and Department of Defense outpatient clinics, but these clinics do not currently report laboratory findings. Chief complaints and diagnoses are assigned, as appropriate, to 11 syndromes (e.g., Gastrointestinal [GI]) (1) and to 78 more granular categories termed sub-syndromes (e.g., abdominal pain, nausea and vomiting, diarrhea) Surveillance for Salmonella infection is important since this agent is both a commonly-reported notifiable disease and a Category B bioterrorist agent.

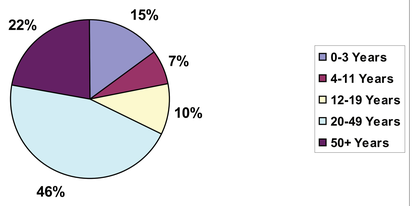
METHODS

We retrieved hospital visits during February 2006-June 2007 with ICD-9 codes associated with Salmonella (003.0-003.9) and investigated which syndromes and sub-syndromes the visits were assigned to. We reviewed laboratory data for LOINC/SNOMED codes or for free text laboratory data that indicated Salmonella organisms. Descriptive statistics are presented.

RESULTS

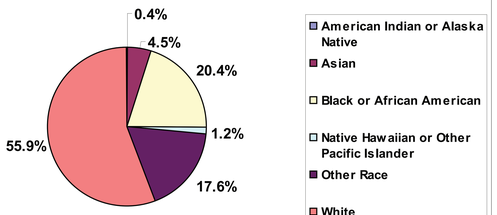
We found 333 visits with a diagnosis of nontyphoidal salmonellosis. Of 324 patients with known hospitalization status, 44.8% (145) were treated as hospital inpatients and the remainder as outpatients. The median age was 30.8; 151 (45.5%) patients were 20-49 years old

Figure 1. Distribution of Patients by Age



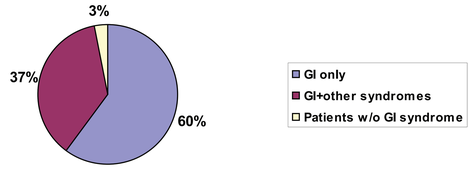
and 224 (67.5%) were women. Among 245 patients with known race, 137 (56%) were white, 50 (20%) were African American, and 11 (4%) were Asian.

Figute 2. Distribution of Patients by Race



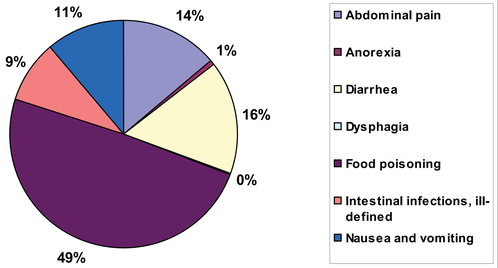
Of the 333, 170 (60%) had diagnoses in the GI syndrome only, 103 (36%) the GI syndrome and other syndromes (i.e., respiratory 13% and fever 21%), and 9 (3%) syndromes other than GI.

Figure 3. Percentage of Patients with Gastrointestinal (GI) Syndrome



Sub-syndromes of the 170 patients with GI syndrome included food poisoning (96.5%), diarrhea (31.8%), abdominal pain (27.1%) and nausea and vomiting (21.8%) (many visits were assigned to >1 syndrome or sub-syndrome).

Figure 4. Distribution of GI patients by Sub-Syndrome



Laboratory results were reported for 70 patients with findings of nontyphoidal Salmonella species, 31 (44.3%) were identified only as Salmonella species, 21 (30.0%) as Salmonella typhimurium, 11 (15.7%) as Salmonella, serogroup D, 5 as Salmonella group O:4, and 2 as Salmonella serogroup D. Matching clinical records were identified for 55 of these patients; 53 (91.4%) were assigned to the GI syndrome, 20 (34.5%) to the Fever syndrome, and 16 (27.6%) to the Hemorrhagic Illness syndrome. Only 20 (36.4%) of these patients had an assigned ICD-9 code for Salmonella.

CONCLUSIONS

Most patients with a diagnosis of nontyphoidal Salmonellosis (97%) had symptoms or diagnoses assigning them to the GI syndrome and the food poisoning sub-syndrome. Systems that link laboratory with clinical data are optimal but difficult to construct. Among hospitals sending laboratory data to BioSense, associated clinical data is available for only some patients with laboratory reports of Salmonella. Studies to determine the completeness of reporting of notifiable diseases to BioSense are needed, and future quality control efforts will be needed to improve the system. The goal is to improve reporting of notifiable diseases and bioterrorist-causes diseases through improved access to quality data from hospital systems.

REFERENCES

1.Syndrome Definitions for Diseases Associated with Critical Bioterrorism-associated Agents. October 23, 2003. Available at: http://www.bt.cdc.gov/surveillance/syndromedef/